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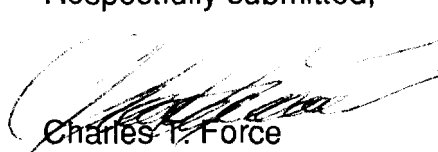
Mr. William F. Caton  
Acting Secretary  
Federal Communications Commission  
1919 M Street, N.W.  
Room 222  
Washington, DC 20554

RE: Ex Parte Presentation  
CC Docket No. 92-297

Dear Mr. Caton:

On August 27, 1993, representatives of NASA met with Chairman Quello and the Commission staff persons listed below to discuss the Commission's pending rulemaking proceeding to allocate spectrum in the 27.5-29.5 GHz band for a new Local Multipoint Distribution Service. The substance of that discussion is summarized in the attached document. Also attached is an updated list of ACTS experimenters and experiments. Please place two copies of these documents in the above-referenced file.

Respectfully submitted,

  
Charles T. Force  
Associate Administrator for  
Space Communications

cc: Hon. James H. Quello  
Mr. Rudolfo M. Baca  
Mr. James R. Keegan  
Mr. Harold Ng

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# **Presentation to the FCC on CC Docket 92-297**

**Charles T. Force**

**NASA Associate Administrator for Space Communications**

**Gregory M. Reck**

**NASA Associate Administrator for Advanced Concepts  
and Technology**

**August 27, 1993**

**FEDERAL COMMUNICATIONS COMMISSION  
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# **NASA Interest in the Proposed LMDS Rulemaking**

- **Under the Clinton Administration's initiative to enhance U.S. industry competitiveness, NASA's mission in space research and technology is to pioneer innovative space concepts and technologies, leveraged through industrial, academic and government alliances, to ensure U.S. commercial competitiveness and preeminence in space**
- **NASA has pioneered space communications in cooperation with the FCC since 1961 (interagency agreement)**
- **The ACTS satellite is designed to pioneer new technology and applications in the 30/20 GHz bands by the U.S. satellite communications industry**
- **The proposed Local Multipoint Distribution Service (LMDS) presents a threat to the future of the fixed-satellite service**

# **The Advanced Communications Technology Satellite (ACTS)**

- **Purpose**

- **Develop and test high risk technology to keep the U.S. communications satellite industry preeminent in the world**
- **Benefit the FCC's private sector constituency**

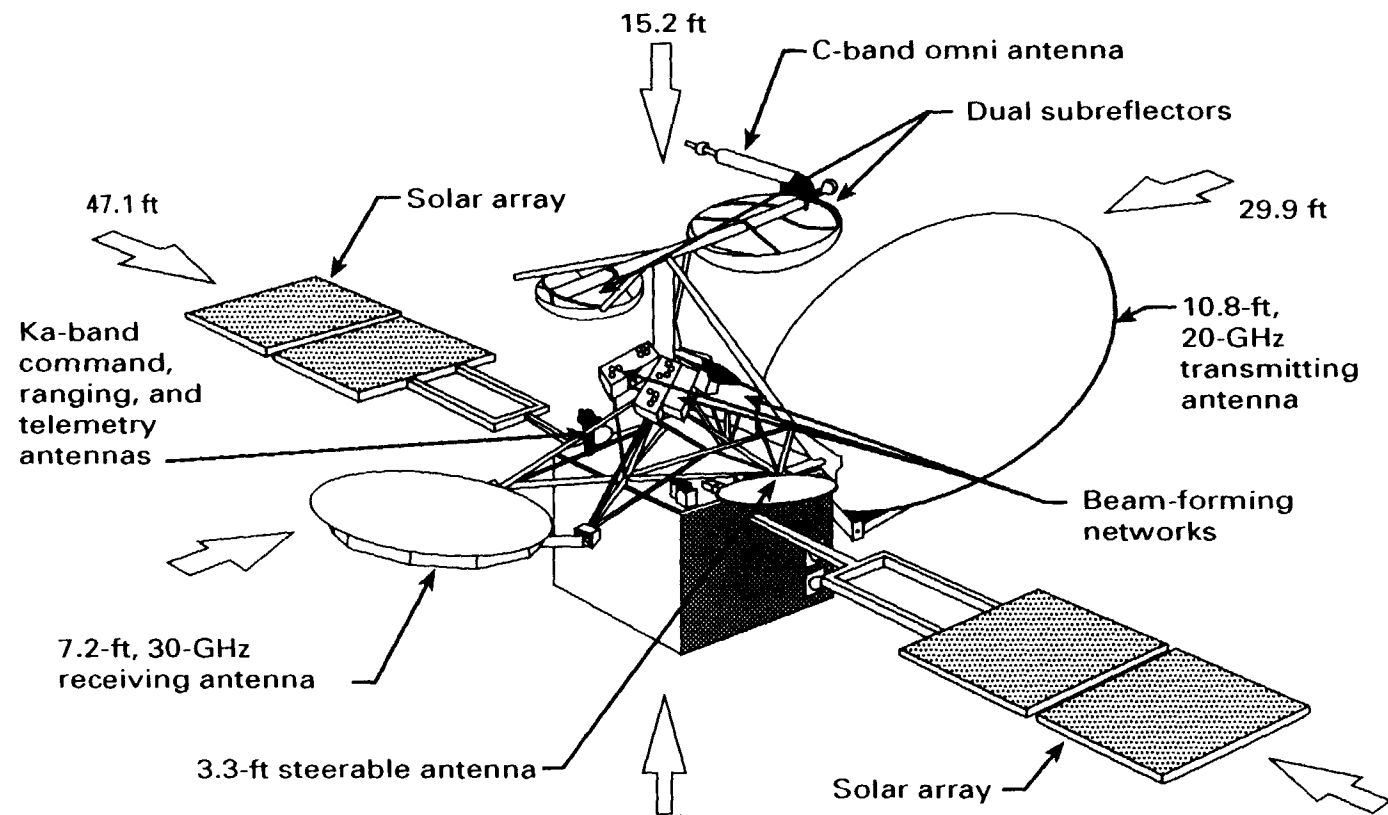
- **Incorporates advanced concepts**

- **Electronically hopping spot beam antennas**
- **Onboard processing and switching**
- **Ka-Band transmission equipment**
- **Dynamic rain fade compensation**

- **Target launch date: September 10, 1993**

- **Mission life: 2 year experiment period with additional 2 year option**

# ACTS Spacecraft



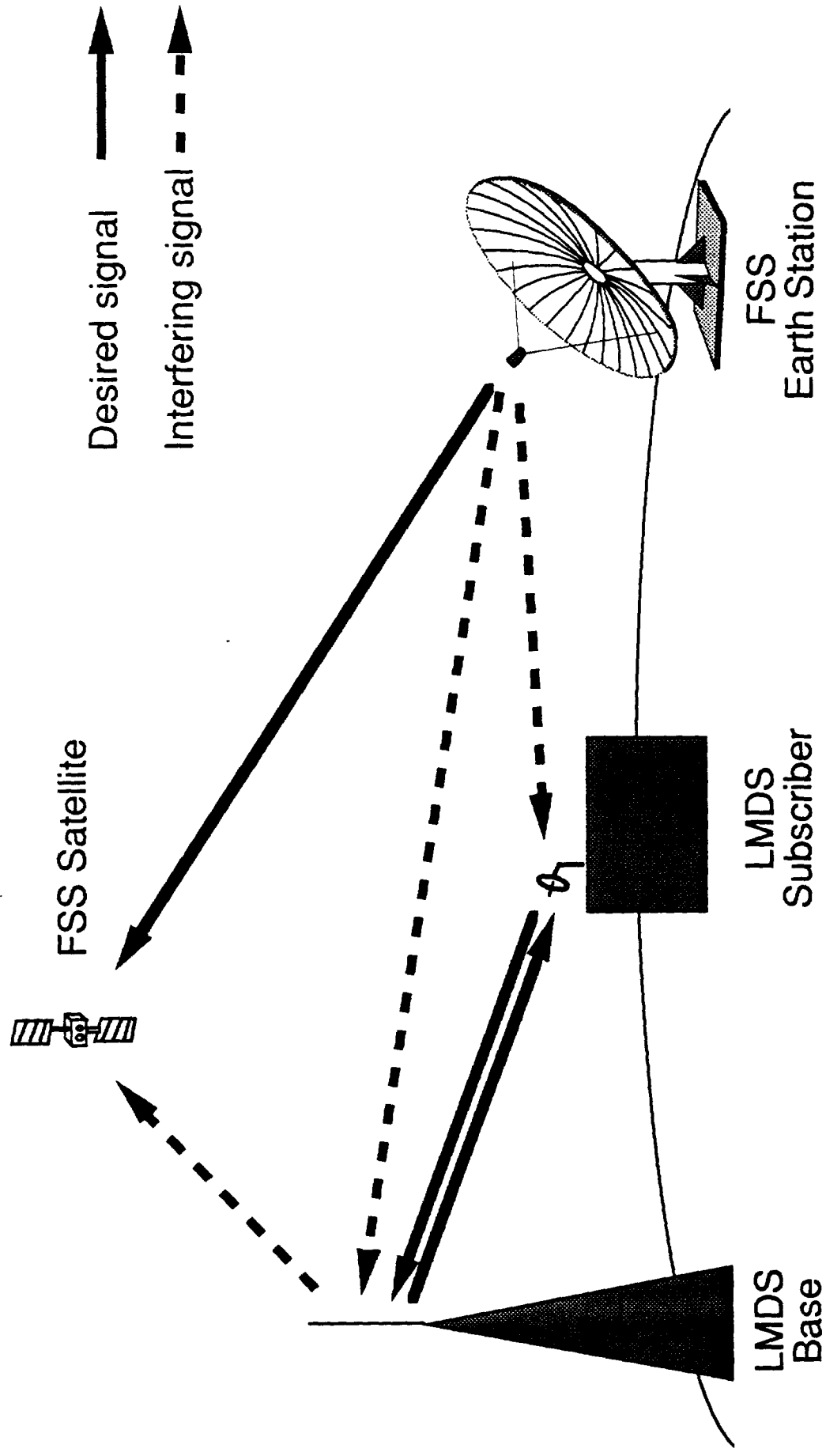
## **ACTS Will Foster Industry Growth**

- **Future applications for FSS have high global potential:**
  - **Business networks**
  - **Mobile**
  - **Medical Imaging**
  - **Science and Education**
  - **Supercomputer networks**
  - **Remote area access**
- **Extensive ACTS experiments program will address these high value applications**
  - **Fully subscribed**
  - **75 experiments by industry, academia and government**
- **Critical for future of U.S. satellite communications industry to maintain 30/20 GHz bands for FSS growth**
  - **Will help stem the tide of growing foreign competition**
  - **Will reaffirm U.S. as leader in satellite communications**

# **The Impact of the Proposed LMDS Allocation**

- **Sharing between the LMDS and the FSS is not feasible**
  - **Unlike the point-to-point fixed service, LMDS is a wide area broadcast service**
  - **Both LMDS and FSS will operate in metropolitan areas**
  - **FSS will interfere with LMDS reception**
  - **Coordination is not feasible**
    - **Supported by industry comments**
- **Future use of Ka-band (27.5-29.5 GHz) by the FSS would be effectively precluded**
  - **80% of the uplink band would be unuseable**
  - **The companion 17.7-19.7 GHz band would lie fallow**
- **This same band is allocated worldwide for the FSS**
  - **Experimental satellites now in use in Japan and Europe**
- **Taxpayer investment in ACTS of ~ \$1 billion would be lost**

# FSS — LMDS Interference Paths





## **NASA Recommendation**

- **Delay decision on allocation of 27.5-29.5 GHz for 5 years**
  - **Results of ACTS experiments will be evaluated**
  - **Growth of FSS use of Ka-band can be assessed**
    - **NASA believes that the entire band from 27.5-30 GHz will be fully utilized by the FSS**
- **Allocation of a different band for LMDS would result in a win-win solution**
  - **European long range spectrum plan would allocate the band 40.5-42.5 GHz for LMDS type services**
    - **Common band would provide opportunities for U.S. industry**
  - **Common international allocation for FSS avoids coordination problems with U.S. neighbors**
  - **Enables market growth for both FSS and LMDS**

## Summary

- Ka-band has long been earmarked for future growth by the U.S. and worldwide satellite industry
- The FSS will need the full 2500 MHz uplink allocation
- Sharing between the FSS and LMDS is not feasible
- The proposed allocation would have a severe impact on the U.S. satellite industry growth and competitiveness
- ACTS is a \$1 billion investment designed to advance Ka-band technology for the commercial satellite industry
- Allocation of an alternative band not shared with the FSS would serve all groups well
- NASA would be pleased to perform additional studies that would aid the Commission in this decision

**APPROVED ACTS EXPERIMENTERS/EXPERIMENTS**  
September 1, 1993

**Application and Technical Verification Experiments**

<b>Organization</b>	<b>Title</b>	<b>Location(s)</b>
National Communications System	1) PSN Restoration 2) PSN Trunking 3) Isolated User Access 4) Secure Mobile Communications	Reston, VA Pasadena, CA Los Angeles, CA
National Telecommunications and Information Administration, Institute for Telecommunication Sciences	Quantify ACTS End-to-End Communication System Performance	Boulder, CO
U.S. Army Research Labs	Integrated Services Digital Network (ISDN) via ACTS	Atlanta, GA
U.S. Army Space Command	Army ACTS Experiments	Ft. Monmouth, NJ Bedford, MA Ft. Gordon, GA Ft. Leavenworth, KS Colorado Springs, CO
Jet Propulsion Laboratory	1) Baseline Land-mobile Experiments 2) ACTS Aeronautical Experiment	Los Angeles, CA Cleveland, OH Aero-Chicago, IL, Cleveland, OH, and Washington, DC
Johnson Space Center	Application of Small Earth Stations in Conducting Telescience and Telemedicine	Houston, TX
New Mexico State University	Real-time, High-bandwidth Data Links	Las Cruces, NM Apache Point Observatory, NM
Public Broadcasting Service	High Definition Television Demonstration	Alexandria, VA
Georgetown University	1) Georgetown Technical Hemispheric Intercultural Network for Knowledge (G-THINK)	Washington, DC 4 locations in South America
School of Medicine	2) Remote Radiology	Washington, DC and Honolulu, HI
COMSAT Laboratories	1) ISDN Experiments 2) Hopping Beam TDMA Operation Observations	Clarksburg, MD
Mayo Foundation	Application of NASA ACTS System to the Practice of Medicine in an Integrated Group Practice	Rochester, MN Scottsdale, AZ Eau Claire, MN Red Lake, MN Decorah, IA Flagstaff, AZ
Dataflow Systems	Direct to Premises ACTS-based Video Services	To be determined
Orion Satellite Corporation	ACTS Experiments Proposal	To be determined

<b>Organization</b>	<b>Title</b>	<b>Location(s)</b>
George Washington University	Supercomputer Networking Applications	Washington, DC
MITRE Corporation	Protocol Evaluation for Advanced Space Data Interchange	Reston, VA
Motorola Inc.	1) HBR Modem Evaluation 2) BBP Transmit Window Characterization 3) Coding Gain Evaluation	Chandler, AZ
New Jersey Institute of Technology	Traffic Modeling, Channel Characterization, Coding, and Modulation on the ACTS	East Windsor, NJ
Southern California Edison Co.	Low Cost SCADA Network	Los Angeles, CA Cleveland, OH
American Express	Availability Comparison between Ku and Ka Satellite Technologies	Phoenix, AZ Mexico City, Mexico
Ohio University	Disaster Recovery, Backup, and Communications Augmentation Experiment Using ACTS	Columbus, OH Athens, OH
U.S. Army Topographic Engineering Center	Use of ACTS for Communicating Differential GPS	Ft. Belvoir, VA Ft. Monmouth, NJ White Sands, NM
COMSAT World Systems	Prototype INTELSAT Operations	Clarksburg, MD
University of Hawaii (PACSPACE)	Advanced Applications to Validate ACTS Technologies	Honolulu, HI
University of Maryland Center for the Commercial Development of Space	Frame Relay Experiment over ACTS: LAN Interconnection Services	Clarksburg, MD
National Science Foundation	Antarctic Researcher Support	Palmer Station, Antarctica
University of Florida	Narrowband ISDN Applications Using ACTS	Gainesville, FL
COMSAT Laboratories/INTELSAT	Demonstration of Advanced Networking Concepts	Clarksburg, MD
EMSAT: Advanced Technology for Emergency Medical Services	Emergency Medicine Land-Mobile Satellite Experiment	Los Angeles, CA Pasadena, CA Cleveland, OH
Kennedy Space Center	Distance Learning in the Area of Hazardous Materials and Environmental Safety	Kennedy Space Center, FL
Bellcore/Personal Communications Applications Research	Experimentation with Satellite-based Personal Communications Services (PCS)	New Jersey Cleveland, OH
Corporate Computer Systems	High Quality Audio (AMT) Experiment	Holmdel, NJ Cleveland, OH
IDB Communications Group, Inc.	Satellite News Gathering Land-Mobile Experiment/Demonstration	Between, Chicago, Cleveland, and Washington

<b>Organization</b>	<b>Title</b>	<b>Location(s)</b>
National Library of Medicine	VAMA: VSAT Access to Medical Archives	Bethesda, MD San Francisco, CA
NBC	1) T1 VSAT Backhaul Experiment 2) Satellite News Vehicle AMT Experiment	New York, NY Cleveland, OH
Florida Atlantic University Center for the Commercial Development of Space	ACTS Wide Bandwidth and Video Compression Experiments	Cleveland, OH
University of Washington	ACTS/AMT Telemedicine Experiment	Seattle, WA
Indiana State University	Distance Education Experiments (4 experiments)	South America, Mexico, Terre Haute, IN
Martin Marietta Astrospace	Business Telecommunications for Potential Customers	East Windsor, NJ and various locations
Florida A&M University	Distance Learning	Tallahassee, FL Miami, FL
Advanced Research Projects Agency	High Data Rate Terminal Development and Experiments	Various locations
NASA Lewis Research Center	1) On-orbit Spacecraft Dynamics 2) Mini Terminal Test Bed 3) Multibeam Antenna Performance Verification 4) Networking Technical Experiment for BBP Operations 5) Microwave Switch Matrix and Wideband Transponder Performance Evaluation 6) Communications Link Performance 7) ACTS Propagation Studies 8) Autotrack Control Performance 9) HBR SMSK Interference Experiment 10) Compressed Digital Video Transmission 11) North American ISDN Users' Forum Demonstration	Cleveland, OH

## **Propagation Experiments**

<b><i>Organization</i></b>	<b><i>Title</i></b>	<b><i>Location(s)</i></b>
Johns Hopkins University and University of Texas at Austin	Land-Mobile-Satellite Measurements in Central Maryland and Alaska Using ACTS: Passive Antenna Tracking System and Mobile Receiver System	Various locations in Maryland, Texas, and Alaska
COMSAT Laboratories	1) ACTS Uplink Transmit Power Control Measurement Experiment 2) Ka-band Propagation Measurements Experiment Using ACTS Spacecraft 3) ACTS Wide Area Diversity Experiment	Clarksburg, MD
Stanford Telecommunications Inc.	A Proposal for ACTS Propagation Experiments	White Sands, NM
University of Oklahoma	Rain Attenuation Statistics for the ACTS Propagation Experiment for Central Oklahoma	Norman, OK
University of Alaska, Fairbanks	ACTS Propagation Measurements in Alaska	Fairbanks, AK
Colorado State University	Ka-band Propagation Studies Using ACTS Propagation Terminal and the CSU-CHILL Multiparameter, Doppler Radar	Ft. Collins, CO
University of British Columbia	ACTS Ka-band Propagation Measurements in a West Coast Maritime Climate	Vancouver, British Columbia
Florida Atlantic University and University of South Florida	Propagation Measurements Using ACTS	Boca Raton., FL
Georgia Tech Research Institute	RF Propagation Effects and ACTS Satellite Channel Characterization for Very Small Aperture Terminals	Atlanta, GA
Teleglobe Canada	Measuring Propagation Effects Utilizing ACTS	Montreal and Toronto